BULLETIN

OF THE INSTITUTE OF METALS

VOLUME 2 SEPTEMBER 1954 PART 13

INSTITUTE NEWS

General Meeting, London

For the benefit of members who were unable to take part in the Autumn Meeting in Switzerland, a special General Meeting of the Institute will be held at 4 Grosvenor Gardens, London, S.W.1, for the discussion of papers on Thursday and Friday, 25 and 26 November 1954. The programme is as follows:

25 November, at 2.30 p.m.

Discussion on: The Constitution of Titanium Alloys, based on the following papers (to be introduced by a Rapporteur) published in the *Journal*:

"The Structure of Titanium–Tin Alloys in the Range 0–25 At.-% Tin", by H. W. Worner (Serial No. 1473; July 1953).

"The Reinvestigation of a Nickel–Titanium Alloy and Observations on $\beta/(\alpha+\beta)$ Boundaries in Titanium Systems", by A. D. McQuillan (Serial No. 1494; Sept. 1953).

"The Free-Energy Diagram of the System Titanium–Oxygen", by O. Kubaschewski and W. A. Dench (Serial No. 1500; Oct. 1953).

"The Structure of Titanium–Silver Alloys in the Range 0–30 At.-% Silver", by H. W. Worner (Serial No. 1515; Jan. 1954).

"A Redetermination and Interpretation of the Titanium-Rich Region of the Titanium–Chromium System", by (Mrs.) M. K. McQuillan (Serial No. 1535; May 1954).

"Methods for Determining the Liquidus Points of Titanium-Rich Alloys", by W. Hume-Rothery and D. M. Poole (Serial No. 1545; June 1954).

"Note on the Constitution of the Titanium–Gold System in the Region 0–6 At.-% Gold", by (Mrs.) M. K. McQuillan (Serial No. 1548; July 1954).

"The Constitution of the Titanium-Rich Alloys of Titanium, Iron, and Oxygen", by N. P. Allen, T. H. Schofield, and (Mrs.) B. Mellish (Serial No. 1551; July 1954).

26 November, at 10 a.m.

Discussion on: Preferred Orientation, based on the following papers published in the *Journal*:

"A Theoretical Investigation of the Deformation Textures of Titanium", by D. N. Williams and D. S. Eppelsheimer (Serial No. 1476; July 1953).

"A Study of Preferred Orientation in Extruded, Drawn, and Annealed Copper", by P. G. Bastien and J. Pokorny (Serial No. 1553; Aug. 1954).

"Preferred Orientation in Rolled Uranium Sheet", by J. Adam and J. Stephenson (Serial No. 1555; Aug. 1954).

26 November, at 2.30 p.m.

Discussion on: Corrosion and Staining of Aluminium Alloys, based on the following papers published in the *Journal*:

"The Influence of Extrusion Direction on the Corrosion and Stress-Corrosion of Aluminium–Copper–Magnesium Alloys" by E. A. G. Liddiard and Winifred A. Bell (Serial No. 1534; May 1954).

"Staining of Clad Aluminium Alloy Sheets During Salt-Bath Heat-Treatment", by E. C. Williams and H. J. G. Challis (Serial No. 1541; June 1954).

Symposium on "The Mechanism of Phase Transformations in Metals"

The Metal Physics Committee of the Institute is proposing to hold in London a one-day symposium on "The Mechanism of Phase Transformations in Metals", at a date which will probably be in November 1955.

The symposium will be in two parts, the morning session being devoted to transformations which are largely governed by thermal activation (nucleation and growth reactions), and the afternoon session to transformations in which thermal activation is less important (martensitic reactions).

Review papers are being invited to introduce each session, but in addition the Committee will be glad to consider offers of short original contributions (up to 3000 words) from workers in the field of phase transformations. In these contributions emphasis should be laid on the results and their interpretation rather than on details of experimental technique.

All those wishing to submit a short communication of this kind, are invited to send the title and a brief summary, as soon as possible, to the Editor, The Institute of Metals, 4 Grosvenor Gardens, London, S.W.1. The Committee will subsequently notify authors whose contributions it is proposed to include in either the morning or afternoon session, and final MSS. must be in the Editor's hands by 31 January 1955.

Election of Members

The following 16 Ordinary Members, 1 Junior Member, and 7 Student Members were elected on 13 August 1954:

As Ordinary Members

BRYNDUM, Andreas Ejnar Vincens, M.Sc., Works Manager, Paul Bergsøe and Son, Glostrup, Denmark.

COLLAUD, Albert, Dr.-Ing., Vice-Director and Chief Metallurgist, Gesellschaft der Ludwig von Roll'schen Eisenwerke, Gerlafingen (Solothurn), Switzerland.

CONNOR, Eric Decimus, B.Sc., Engineer of Tests, Victorian Railways Laboratory, Newport, Vic., Australia.

DICK, James Gardiner, B.Sc., Chief Chemist and Metallurgist, Canadian Bronze Co., Ltd., 999 Delorimier Avenue, Montreal 24, Que., Canada.

DOUGLAS, Llewellyn, D.Sc., M.I.Mech.E., M.I.Loco.E., Chief Mechanical Engineer, South African Railways, P.O. Box 1006, Pretoria, South Africa.

FERON, Michel Adolphe Maurice, M.B.A., Administrateur, S.A. Metallo-Chimique, 8 rue d'Egmont, Bruxelles, Belgium.

FRANK, *Professor* Frederick Charles, O.B.E., B.A., B.Sc., D.Phil., F.R.S., Professor of Physics, The H. H. Wills Physical Laboratory, University of Bristol, Royal Fort, Bristol 8.

GRAM, Niels, M.Sc., Metallurgist and Technical Adviser, Paul Bergsøe and Son, Glostrup, Denmark.

HILL, Kenneth, Tool Controller, The Yorkshire Copper Works, Ltd., Stourton, Leeds.

INSKIP, Kenneth Walter, F.L.A., Borough Librarian, Central Public Library, Smethwick, Staffs.

JAMES, Raymond John Charles, L.I.M., Metallurgist, Evered and Co., Ltd., Smethwick 40, Staffs.

KAMATH, Karkala Vasudev, B.Sc., Lecturer in Metallurgy, Victoria Jubilee Technical Institute, Matunga, Bombay 19, India.

KODA, *Professor* Shigeyasu, D.Eng., B.Sc., Professor of Metallurgy, Department of Metallurgy, Faculty of Engineering, Hokkaido University, West 8 Avenue, North 12 Street, Sapporo City, Japan.

MUIR, Hugh, B.Met.E., Sc.D., A.I.M., Senior Lecturer in Metallurgy, School of Mines and Metallurgy, University of Otago, Dunedin, New Zealand.

RYLANCE, William Joseph, Metallurgical Chemist, Holman Michell and Co., Ltd., Cornwall Works, St. Helens, Lancs.

VAN DER STRATEN P., *Comte* Hugues Pierre Charles Marie, Administrateur, Secrétarie-Général, Société Industrielle de l'Aluminium S.A. (SIDAL), 17 Notmeir, Duffel, Belgium.

As Junior Member

VIDEIRA, Fernando Henrique Marques, Chem.Eng., Centro de Estudos da Energia Nuclear, Instituto Superior Técnico, Av. Rovisco Pais, Lisbon, Portugal (temporarily at the National Physical Laboratory, Teddington).

As Student Members

BERRY, Roy David, Metallurgical Laboratory Assistant, D. Napier and Sons, Ltd., The Vale, Acton, London, W.3.

COILEY, John Arthur, B.A., Department of Metallurgy, University of Cambridge.

HIGGINS, Terence Stanley, B.Sc., A/Pilot Officer, The Royal Air Force. (mail): 5 Sion Place, Bathwick Hill, Bath, Somerset.

JEMINSON, Gordon Victor, Department of Metallurgy, University of Manchester.

KUMAR, Rajendra, B.Sc., M.Met., Department of Metallurgy, University of Sheffield.

MORTLOCK, Allan John, M.Sc., A.Inst.P., Research Student, Physics Research Laboratory, University of Reading.

PHILIP, T.V., B.Sc., M.S., Research Assistant, Department of Mining and Metallurgy, University of Wisconsin, Madison, Wis., U.S.A.

Joint Library Facilities

New members are reminded of the valuable facilities available to them through the Joint Library of the Iron and Steel Institute and the Institute of Metals. Books and periodicals can be borrowed by members resident in the United Kingdom not only from the Joint Library but also, on application through the Librarian, from the Science Library and the National Central Library. Members are required to pay only return postage. Moreover, under certain conditions, photocopies and microfilms of documents can be obtained for members, both in the United Kingdom and abroad. All requests for loans, &c., should be addressed to the Librarian, The Joint Library, 4 Grosvenor Gardens, London, S.W.1.

PERSONAL NOTES

MR. W. F. BRAZENER, Managing Director of The Mint, Birmingham, Ltd., has been elected President of the British Non-Ferrous Metals Federation.

MR. E. I. BRIMELOW, of the Building Research Station, is one of two liaison officers who have recently been appointed at the National Physical Laboratory to promote closer contact between the Laboratory and industry.

MR. SPENCER H. BUSH is now in charge of Physical Metallurgy Research at the General Electric Company's Applied Research Subsection, Engineering Department, at the Hanford atomic installation near Richland, Wash., U.S.A.

MR. G. B. GARNHAM has joined the board of A. Strauss and Co., Ltd.

MR. W. L. GOVIER has been transferred from the Kirkby Works of Imperial Chemical Industries, Ltd., Metals Division, to the Allen Everitt Works, Smethwick.

MR. G. H. JUDD, Chief Chemist and Metallurgist to Sterling Metals, Ltd., Coventry, has retired after 44 years' service with the Company.

MR. W. G. MOCHRIE, London Manager of Tyseley Metal Works, Ltd., has been awarded the Meritorious Services Medal of the Institute of British Foundrymen in recognition of his services as Honorary Secretary of the London Branch since 1949.

PROFESSOR A. PORTEVIN has been elected a Foreign Associate of the U.S. National Academy of Sciences.

MR. M. C. REGAN has recently been awarded the B.Sc. degree of Durham University.

MR. F. W. ROWE, Managing Director of K. and L. Steelfounders and Engineers, Ltd., has been awarded the E. J. Fox Medal of the Institute of British Foundrymen.

SIR ARTHUR SMOUT has received the honorary degree of LL.D. of the University of Wales in recognition of his work for industry in South Wales and of his contribution to technological education.

Mr. G. A. Steel has retired from the board of The British Aluminium Co., Ltd.

Mr. W. Vickers has been awarded the degree of B.Met. with Honours at Sheffield University.

Dr. R. L. Woolley has left the Department of Natural Philosophy, St. Andrews University, to occupy the Chair of Physics at the College of Arts and Science, Baghdad, Iraq.

PERSONALITIES

Dr. J. C. Chaston

(Chairman, London Local Section)

Jack Chambers Chaston was born in 1903 and educated at Dulwich College and the Royal School of Mines, obtaining the A.R.S.M. in 1924. In the same year he was awarded the B.Sc. degree of the University of London with First Class Honours and in 1938 the Ph.D. degree in the same University. From 1925 to 1936 he was metallurgist with Standard Telephones and Cables, Ltd., being concerned with the development and production of powdered Permalloy cores, magnetic alloy strip, and lead and lead alloys for cable sheaths. He was then for two years Senior Lecturer in Metallurgy at the Royal Technical College, Glasgow. In 1938 he joined Johnson, Matthey and Co., Ltd., to take charge of metallurgical and physical research, and in 1952 he was appointed to his present post of Chief Metallurgist and Manager of the Company's Research Laboratories at Wembley.

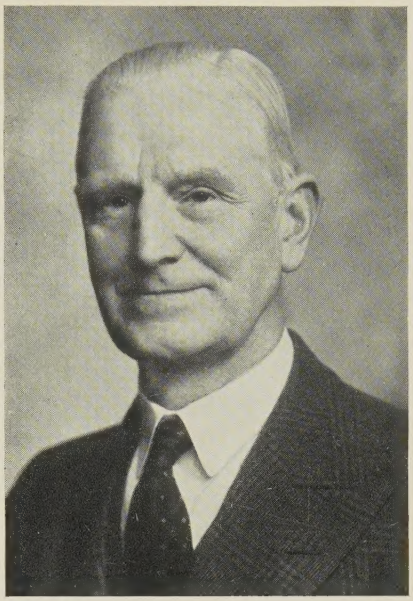
Dr. Chaston is an Associate of the Institute of Physics and a Fellow of the Institution of Metallurgists. He has been a

member of the Institute since 1922 and has published papers on metallurgical subjects in the *Journal* of the Institute and elsewhere.

Mr. G. MacDonald

(Chairman, Scottish Local Section)

George MacDonald was educated at the Royal High School, Edinburgh, and at Edinburgh University, where he obtained a B.Sc. degree in Engineering. He was apprenticed to James Bertram and Sons, Ltd., manufacturers of paper-making machinery, and also served with the District Engineer of the Caledonian Railway. In 1913 he joined Halley's Industrial



Motors, Ltd., as Head of the Research and Theoretical Department, but left on the outbreak of the First World War to take a commission in the Royal Engineers. He returned to Halley's in 1917 as Assistant Engineering Manager, later becoming Engineering Manager and Director. In 1933 he joined his present firm of E. Chalmers and Co., Ltd., Edinburgh, scrap metal merchants and non-ferrous ingot manufacturers.

During the Second World War Mr. MacDonald served in the Ministry of Aircraft Production successively as Assistant Director, Deputy Director, and Director of Armament Production and in 1944 became Deputy Director General of Equipment Production. For his wartime services he was awarded the O.B.E. In 1945 he rejoined E. Chalmers and Co., Ltd., of which firm he is a director.

Mr. MacDonald is a member of the Institution of Mechanical Engineers and an associate member of the Institution of Civil Engineers. He joined the Institute of Metals in 1934, and served on the Scottish Local Section Committee both before and after the last war.

Mr. S. S. Smith

(Chairman, Birmingham Local Section)

Samuel Spenceley Smith is Research Manager of Imperial Chemical Industries, Ltd., Metals Division, having been associated with that Company since 1930, when he assumed responsibility for the scientific control of tool materials. His interest in this subject developed during a previous appointment with a firm of mining-tool manufacturers, and also from his first research work, which included a pioneer study of the nitriding of steel. This was carried out whilst he was successively a Styring Post-Graduate Research Scholar and the George Senior Research Fellow of the University of Sheffield. In 1926 he was awarded the Brunton medal and premium of the same University.

While with I.C.I. Mr. Smith has become increasingly concerned with the non-ferrous metals and during the war was closely associated with atomic-energy projects both in this

country and the U.S.A. He takes some little pride in having a wide range of interests and in the fact that his preparatory school completely neglected science, but made a serious attempt

to teach him Latin and the art of reading. Later, circumstances dictated a change, and a somewhat halting introduction to the technical career already outlined.

NEWS OF KINDRED SOCIETIES

Indian Institute of Metals

The Eighth Annual General Meeting of the Indian Institute of Metals will be held on 23–25 January 1955, at the United Club, Jamshedpur. Besides the usual technical sessions, there will be a Metallographic Exhibition, and prizes will be awarded to the best entries.

The Jamshedpur Chapter of the Institute will inaugurate the Educational Lecture Series on metallurgical engineering concurrently with the Annual Meeting. The first series of lectures will be on the Blast Furnace Process. The programme will also include visits to The Tata Iron and Steel Co., Ltd., The Tata Locomotive and Engineering Co., Ltd., The Indian Steel and Wire Products, Ltd., the National Metallurgical Laboratory, and the Indian Copper Corporation, Ltd. The Annual Dinner will be held at the Beldih Club, Jamshedpur, on 23 January 1955.

Société Française de Métallurgie

The Autumn Meeting of the Société Française de Métallurgie will be held at the Maison de la Chimie, Paris, from 25 to 30 October. In addition to the presentation of papers on a variety of subjects, two symposia are being arranged, one on "Sulphur in Iron- and Steel-making," and the other on "Metals of the Platinum Group". In connection with the latter, an exhibition will show the various applications of these metals. During the meeting, the Société's Le Chatelier Medal is to be presented to Professor A. F. Westgren of Stockholm.

Members of the Institute of Metals are cordially invited to be present at this meeting, full details of which will be available at the end of September from the offices of the Société, 25 rue de Clichy, Paris (9e).

OTHER NEWS

Memorandum on Higher Technological Education

On 23 July last, the Chairman of the Parliamentary and Scientific Committee (Sir Wavell Wakefield, M.P.) sent to the Chancellor of the Exchequer, the Minister of Education, and other Ministers concerned, copies of a Memorandum on Higher Technological Education drawn up by a sub-committee.

As this report refers particularly to the shortage of metallurgists, it is thought that members may be interested in the summary of it which is given below. Copies of the report itself may be obtained from the Secretary, the Parliamentary and Scientific Committee, 31 Palace Street, London, S.W.1, price 2*s*.

General

The national interest demands a further and steadily continuing expansion of facilities for training in this country in applied science. Such expansion is particularly needed to graduate and post-graduate level, and as regards the engineering and related technologies which are concerned with converting scientific knowledge to effective use in every type of industry.

There is already a considerable unsatisfied demand for scientists, engineers, and other types of qualified technologists in British industry. There is a particular shortage of metallurgists and chemical engineers, and of those who are able to take posts in management or on the production side.

We are of the opinion, therefore, that further Government action in support of the development of better facilities for higher technological education in this country is urgently needed.

Universities

For the time being there is no need to envisage any further major expansion of the University student population in this country. Already the capacity for University students in technology is not completely filled, and the proportion of science students in relation to art students could well be increased in the national interest.

We note with satisfaction the Government's recent decision to double the student output of the Imperial College of Science and Technology during the quinquennium 1957–62, and to raise the present number of their full-time students from 1650 to 3000. We would, however, draw attention to the fact that no very rapid results can be expected from this expansion plan, since it will be some ten years before all the extra facilities for dealing with double the number of students will be in existence.

Since this Report was first drafted, we have noted with interest the announcement by the Chancellor of the Exchequer in the House of Commons on 13 July 1954, to the effect that he has approved plans for further development in connection with higher technological education at the Universities of Glasgow, Manchester, Leeds, and Birmingham.

Recommendations

We hope that the Government will continue to support the financial requirements of the Universities on the same bold and

generous scale as has been agreed by all Governments since the war.

The University Grants Committee should give increasing attention to the problem of ensuring that the Universities will provide the country with a growing number of scientists and technologists within the overall student population. We would also urge that it is of increasing importance that our scientists, engineers, and technologists should be well versed in the humanities and the art of management, especially if more of them are to enter the field of administration either in the Civil Service or the control of nationalized undertakings or as directors on the boards of private-enterprise companies.

Colleges of Technology

In the Universities it is pleasing to note the useful progress made, but in the Colleges of Technology, which, with the Universities, are jointly responsible for the task of training technologists, we regret that much still remains to be done.

In view of the present financial difficulties of the country, it is obviously wise to spend money on developing some of the better of our technological institutions rather than to embark on the construction of entirely new premises.

There is widespread agreement that there should be far better facilities for the provision of what are known as "sandwich" courses. Such courses could be carried out most satisfactorily if confined to a limited number of technical colleges in the country where really adequate facilities could be provided.

The primary need today is to concentrate on increasing the facilities for turning out a larger number of highly trained technologists in addition to those who graduate from Universities.

Experience during recent years appears to show that there are real difficulties in the way of establishing any satisfactory regional basis for a major College of Technology, so long as such a college is the major responsibility of a single Local Education Authority.

The Committee therefore concurs in the widespread support which now appears to exist for selecting a certain number of the leading Colleges of Technology for special treatment on a national basis.

The Committee is satisfied that only by such selection and by such freeing from single local-authority finance, administration, and control will it be possible to provide sufficient facilities in this country for advanced technological studies for all those who require and can make good use of them.

Recommendations

A few Colleges of Technology should be selected and granted a Royal Charter, under which they would be described as Royal Chartered Colleges of Technology. These selected colleges should be provided with strong governing bodies having adequate representation of industrial, commercial, and university interests in the region, as well as of the Local Education Authorities, the Ministry of Education, and the professional institutions.

There would be great advantages in giving the Royal Chartered Colleges complete financial independence in the same way as the Universities on a quinquennial basis.

According to the latest available information, there would appear to be about twenty technical colleges in the country which are capable of fulfilling such requirements, and it is clear, therefore, that the maximum number which can be regarded as eligible for advancement to this higher status cannot be in excess of that number.

We regard it as important that these Royal Chartered Colleges should not be too specialist in character. There must be a reasonable infusion of the humanities as well as mathematics, science and technology, &c., in the courses.

Awards

Much of the delay and hesitation in the past years in developing and making better use of our major Colleges of Technology has been due to the unhappy controversy as to the nature of the awards which these major colleges should be entitled to give to their successful students.

In our opinion too much stress has been laid on this particular issue. If the proposed Royal Chartered Colleges of Technology developed a high standard of teaching, the men they produced would enjoy a high prestige amongst all employers whatever letters they might be entitled to put after their names. Moreover, in this connection it should be noted that the qualified membership of various professional and technological institutions in this country already provides in many respects a higher assurance of technological capacity than any university degree.

After considering all the alternative proposals, the Committee has come to the conclusion that for the Royal Chartered Colleges of the standard envisaged in this Report, the appropriate award in established technologies would be the degree of Bachelor of Technology.

Recruitment for Science and Technology from the Schools

There is overwhelming evidence that the ability of the Universities and Colleges of Technology to turn out an adequate number of science graduates of sufficiently high quality is to a very large extent dependent on the creation of a bigger demand from the school population of the country for education in science and technology.

It is clear that the ability of the Universities and the Colleges of Technology to carry out what is required depends very much on a change of climate relating to science and technology, and the improvement of facilities for teaching science at such schools.

Another aspect of this matter is the maintenance of the outworn tradition in so many of our grammar and public schools that the proper goal for all bright boys is a classical education, an arts course at the university, and avoidance of anything to do with industry and factories. Of the 8000 State scholars in this country, only about 600 are specializing in scientific subjects. In many new secondary schools accommodation for practical work is almost non-existent, so that science, if it is taught, is taught largely from text-books and blackboards, with unfavourable reactions on the teachers' success.

There is a great deal that industry and the professional institutions of scientists and technologists can do to break down the unfortunate tradition referred to in the above paragraph. There can, however, be no short-term remedy for this undesirable state of affairs. It will need intensive and long-term efforts by industry and the professional institutions.

Co-operation with Industry

There is still scope for greater co-operation between industry and the Universities and Technical Colleges.

Much of the expansion now taking place in University facilities is for post-graduate teaching and research work. Such facilities also exist in the Technical Colleges. Unfortunately at the present time there are insufficient grants

available for post-graduate students, and a very large proportion today come from overseas. Industry should be encouraged to provide grants of this nature, as it is important to maintain the level of work of the most advanced type, if we are to maintain and extend our scientific and industrial lead.

No Lumber in the Back Room?

[Many members concerned with industrial research may be interested to read the leading article from *The Times* of 11 August 1954, which is reprinted, with permission, below.]

Mr. Zvegintzov of the National Research Development Corporation did a useful piece of work at Oxford this week, Addressing a summer school of young business executives, he gave them a truer picture than that usually imagined of the nature and purpose of research. The idea that the country was "swarming with backroom boys inventing things" had to give way to the fact that the bulk of people working in Government laboratories, universities, and medical schools were investigating new scientific techniques and enlarging general scientific knowledge. Necessary as this is in modern society the matter, however, can hardly be left there. As the recent report by the Federation of British Industries Committee showed, the shortage of science teachers is going to be of grave concern in the years immediately ahead. Industry is in fierce competition for scientists with the producers of its future scientists. Its demands will inevitably grow. Without at this moment going into the recommendations for a solution of the problem it is well worth asking how inevitable the demands of industry are.

The end of the Second World War left Britain with a great leeway to make up in many industrial and technical fields. The emphasis was on research. It has stayed so ever since. As recently as two years ago the Department of Scientific and Industrial Research sounded yet another urgent warning that if Britain is to come through its economic difficulties "a far greater use of science—and the word is used in its widest sense—must be made in industry". No one would gainsay this. British industry is almost certainly still behind America in the proportionate number of scientists it employs. Yet Sir Raymond Streat put his finger on a very relevant point last month when, referring to the question whether industry ought temporarily to reduce its competition with the grammar schools for science graduates, he urged that forbearance was essential for the sake of the future. This would be a counsel of despair it if meant impairing or retarding British industrial efficiency. Is there any need for it to do so? If there is to be this fierce competition between industry and teaching for the scientists of to-morrow—when it will be essential for industry on its own behalf to ask each time: "Is your scientist really necessary?"—a useful start could be made by finding out more fully how the present scientists in industry are really employed.

There has been a good deal of research into efficiency. What is now needed is a large-scale inquiry into the efficiency of research. Earlier this year the Manchester Joint Research Council issued a useful report bearing partly on this question. Their effort should be repeated on a much larger and more comprehensive scale. Research has both the advantages and the drawbacks of being infinite. No undertaking can have a precisely calculable maximum point beyond which research is not sensible. The greatest gains in research can come from its scope being indefinite. At the same time for every inch won there may be acres of waste. Research can become a vested interest in itself, can be undertaken for prestige rather than for product, can be duplicated within the same industry, can be so "pure" as to be purposeless, can give a yield hopelessly incommensurate with its effort. To say such things has been unfashionable for a long time past. It can be construed as hostility to research. It is not. It is a plea for the strengthening of research. But managements must be as uninhibited in clearing lumber out of the back room as out of the shop window.

B.I.S.R.A. Corrosion Advice Bureau

The British Iron and Steel Research Association has formed a Corrosion Advice Bureau in order to deal adequately with the numerous enquiries that are received for advice on the prevention of corrosion of ferrous metals.

The Bureau will be situated at 140 Battersea Park Road, London, S.W.11 (Telephone Macaulay 5511). Dr. J. C. Hudson has been appointed Head of the Bureau and Mr. E. E. White, Secretary. Dr. W. H. J. Vernon has been engaged as consultant.

The services of the Bureau will normally be free to members of the Association, and will also be available to others on a fee-paying basis, depending on the extent of the investigations required.

Sulphur Removal and Recovery from Fuels

The deleterious effects of sulphur in fuels and the need to expand home supplies of sulphur have led the Institute of Fuel to arrange a series of conferences on "Sulphur Removal and Recovery from Fuels". The first of these is to be held at the Institution of Mechanical Engineers, 1 Birdcage Walk, London, S.W.1, on 6 and 7 October 1954.

There are four technical sessions, which are open to the public without charge. A charge will, however, be made for copies of preprints of the papers to be presented and also for a conversazione which will take place on the evening of 6 October. Full details may be obtained from the Secretary, The Institute of Fuel, 18 Devonshire Street, London, W.1.

Modern Developments in Electrochemistry

The Department of Extra-Mural Studies of Liverpool University has arranged for a post-graduate course of 20 lectures on "Modern Developments in Electrochemistry" to be given by Dr. A. Hickling (Reader in Physical Chemistry in the University). The lectures will be held in the Muspratt Lecture Theatre, Department of Chemistry, Brownlow Street, Liverpool, from 6.0 to 7.30 on Friday evenings, beginning on 8 October 1954. The fee for the course is £4 4s., and tickets may be obtained from the Director of Extra-Mural Studies, 9 Abercromby Square, Liverpool 7, or at the opening meeting.

Works Visits

Wild-Barfield Electric Furnaces, Ltd., are again extending an invitation to senior students of technical colleges and like institutions to visit their Watford Works during the coming winter season, from October to May. The tours include an inspection of the Research and Development Departments, as well as of the production side, and take place during the afternoon of any work day (Monday to Friday). As these tours have now become a popular feature with senior technical students, readers would be well advised to apply for a date, giving alternatives, as soon as possible.

DIARY

Local Sections and Associated Societies

A copy of the Programme of Meetings of Local Sections and Associated Societies for 1954–55 is being sent as usual to all Members resident in the British Isles. Overseas Members may obtain a copy by application to the Secretary.

23 September. North East Metallurgical Society. Annual General Meeting and Film Show. (Cleveland Scientific and Technical Institution, Middlesbrough, at 7.15 p.m.)

30 September. Birmingham Local Section. "Science and Literature", by Professor H. Dingle. (James Watt Memorial Institute, Great Charles Street, Birmingham 3, at 6.30 p.m.)

5 October. Oxford Local Section. "Diffusion in Metals", by A. D. Le Claire. (Cadena Café, Cornmarket Street, Oxford, at 7.0 p.m.)

6 October. Birmingham Local Section. Visit to works of John I. Thorneycroft, Ltd., Southampton.

7 October. London Local Section. Chairman's Address: "Some Men of Metallurgy", by Dr. J. C. Chaston. (4 Grosvenor Gardens, London, S.W.1, at 6.30 p.m.)

12 October. South Wales Section. "Production and Manipulation of Titanium", by D. E. Yeomans. (Metallurgy Dept., University College, Swansea, at 6.45 p.m.)

13 October. Manchester Metallurgical Society. Presidential Address by J. D. Hannah. (Central Library, Manchester, at 6.30 p.m.)

14 October. Liverpool Metallurgical Society. Presidential Address by G. T. Callis. (Liverpool Engineering Society, 9 The Temple, Dale Street, Liverpool, at 7.0 p.m.)

Other Societies

20 September. Institute of Metal Finishing, London Branch. "Surface Finishes by Vacuum Evaporation", by Dr. F. C. Weil. (Northampton Polytechnic, St. John Street, London, E.C.1, at 6.15 p.m.)

24 September. Institute of Metal Finishing, Sheffield and North-East Branch. "Barrel Polishing". (Grand Hotel, Sheffield, at 6.30 p.m.)

30 September. Institution of Production Engineers, Lincoln Section. "How the Production Engineer Can be Helped by the Metallurgist", by Dr. J. D. Jevons. (Ruston Club, Unity Square, Lincoln, at 7.30 p.m.)

6 October. Institute of Metal Finishing, Scottish Branch. Chairman's Address: "This Electroplating", by S. A. J. Murray. (39 Elmbank Crescent, Glasgow, at 7.0 p.m.)

8 October. Institution of Production Engineers, North-Eastern Graduate Section. "Nickel Plating and Metal Finishing", by L. F. Prior. (Roadway House, 80 Oxford Street, Newcastle-upon-Tyne, at 7.0 p.m.)

THE STRUCTURE OF METALS AND ALLOYS

REVISED EDITION

by W. HUME-ROTHERY and G. V. RAYNOR

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This well-known book by Dr. W. Hume-Rothery was first published in 1936, when it achieved an immediate success, and has since been reprinted seven times. Most of the principles outlined in 1936 have stood the test of time, but the tremendous output of research on the structure of metals and alloys has led to a demand for a thorough revision, and a new edition has now been written in collaboration with Professor G. V. Raynor.

The whole text has been revised and brought up to date, with considerable expansion of the parts dealing with solid solutions and intermediate phases in alloys. Completely new sections have been written on ternary alloys and on alloys of iron, whilst the part dealing with imperfections in crystals has been greatly extended and now includes a comprehensive account of the ideas of dislocation theory.

The description throughout has been kept at an elementary level, and can be understood without a knowledge of higher mathematics or of crystallographic notations. In this form the book should be invaluable to all those who, in the widest sense of the term, call themselves students of metallurgy, and it should also be of great value to physicists, chemists, and engineers.

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METALLURGIST with experience in casting technology required for research, development, and technical sales liaison work on magnesium alloys. Applicants should possess Hons. degree in Metallurgy, or A.I.M., and a knowledge of French and German would be of advantage. Successful candidates will become eligible for entry to the Company's Contributory Pension Scheme. Applications in writing quoting XJIM19 together with age, qualifications, and experience to Personnel Officer (Staff), Magnesium Elektron, Ltd., P.O. Box No. 6, Clifton Junction, near Manchester.

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THE UNIVERSITY OF SHEFFIELD

Applications are invited for the C. H. Desch Research Fellowship tenable in the Department of Metallurgy. The object of the Fellowship is to advance knowledge in the field of Ferrous Metallurgy; candidates should already have some research experience, but not necessarily in this field. Normal tenure will be five years, but the appointment will be for two years in the first instance, and thereafter will be renewable annually. Stipend £750 per annum for the first year, rising by annual increments of £50 to £950 per annum, together with superannuation provision under the F.S.S.U. A higher stipend may be paid to an exceptional candidate. Applications (3 copies), including the names and addresses of referees and, if desired, copies of testimonials, should reach the Registrar (from whom further particulars may be obtained) not later than 30 September 1954.

A. W. Chapman,
Registrar.